

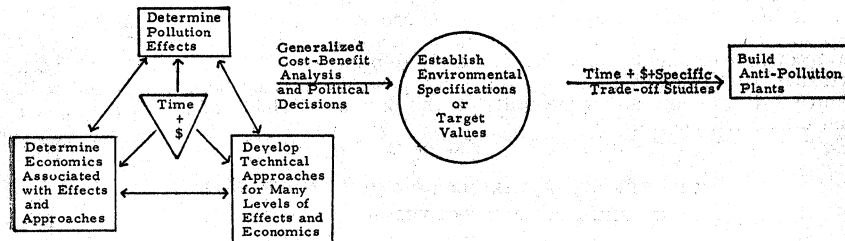
Accordingly, we believe that future work should be undertaken in two distinct phases.

The first phase must clearly attack the obvious sources of pollution, the autos and stationary sources, the primary sewage treatment plants, the industrial firms disposing of large amounts of toxic chemicals, etc. This phase is currently being undertaken or considered by the Federal Government and many State and local authorities.

The second phase is equally important, less obvious, and more difficult, because it will take a great deal of time and money with few tangible results. Its purpose will be to determine the effects of potential pollutants on the earth and its inhabitants; the technical approaches feasible for removing these pollutants; and the costs associated with the effects and the technical approaches. These investigations should be undertaken simultaneously so that information from one can be fed into the other two. The gathering and development of this data may take 10 to 15 years and cost a billion or more dollars. However, we need not wait until the end of the study for results. There can be intermediate steps when tentative specifications can be reevaluated or created. A graphic illustration of this overall approach is presented in figure 1.

FIGURE 1

THE SEQUENCE OF EVENTS FOR A WASTE MANAGEMENT STUDY



The development and analysis of this data is imperative. It will result in an understanding of the problem and the approaches to its solution which will, probably for the first time, permit political bodies to make decisions with full and complete data and with an understanding of what they can achieve, what it will cost, and what it will save.

Once the data is available, then we can begin the very difficult task of designing specifications based on tradeoffs or compromises between certain levels of improvement, our ability to pay for them, and our technological capability for creating them. This situation is in contrast to the best guess approach on which most of today's standards are based. For example, table 1 shows a brief summary of the present drinking water standards of the World Health Organization and U.S. Public Health Service. These do not agree with each other, nor with two California water plan values (for nondrinking water).

More important, the last column presents typical values for the water delivered by the metropolitan water district to several millions of users in the Los Angeles basin over many years, apparently without ill effects. Note how the

TABLE 1.—Selected values for water environmental standards

Condition	WHO International (1958) permissible limit	USPHS (1962) recommended limit	Proposed California water plan	Sacramento River maximum permissible concentration	Colorado River water supplied to the Los Angeles Metropolitan Water District
Dissolved solids parts per million..	500	500	400	525	704
Sulfate do.....	200	250	100	130	297
Chloride do.....	200	250	100	130	92
Sodium percent.....			50	60	63
Hardness as CaCO ₃			160	200	195

¹ Softened from 330.